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दैनिक सामयिक अभिज्ञता सेवा

A Daily Current Awareness Service



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OFF THE LAUNCHPAD

The target missile used by the DRDO in the successful test-firing of the Advanced Area Defence Endo-Atmospheric Interceptor Missile at Abdul Kalam Island in Odisha on Wednesday. *PTI*

THE ASIAN AGE

Homegrown supersonic interceptor missile test-fired in Odisha

This is the second time that the missile has been test-fired in a month and is part of an effort to put in place a missile defence system.

Balasore: India on Wednesday successfully test-fired its indigenously developed supersonic interceptor missile capable of destroying any incoming enemy ballistic missile at low altitude.

This is the second time that the missile has been test-fired in less than a month and is part of an effort to put in place a multi-layer missile defence system.

"Today's test launch was conducted in order to validate various parameters of the interceptor in flight mode," a defence official said, adding that it was a low altitude trial.

The interceptor was engaged against a target which was a Prithvi missile launched from launch complex 3 of the Integrated Test Range (ITR) at Chandipur near Balasore, taking up the trajectory of a hostile ballistic missile.

The target missile was launched at about 10:10 am from Chandipur.

After about four minutes the interceptor, Advanced Air Defence (AAD) missile positioned at Abdul Kalam Island in the Bay of Bengal, getting signals from tracking radars, roared through its trajectory to destroy the incoming hostile missile in mid-air, in an endo-atmospheric altitude, the official said.

"The mission was excellent and it was a direct hit," said a scientist of the Defence Research Development Organisation (DRDO).

The interceptor is a 7.5-meter long single stage solid rocket propelled guided missile equipped with a navigation system, a hi-tech computer and an electro-mechanical activator, the official said.

The interceptor missile had its own mobile launcher, secure data link for interception, independent tracking and homing capabilities and sophisticated radars, the official added.

On February 11, an incoming hostile ballistic missile target was successfully intercepted at high altitude, above 50 km of the earth's atmosphere by an exo-atmospheric interceptor missile off the Odisha coast.

Earlier, a low altitude (endo-atmospheric) test of AAD missile was successfully test launched on May 15, 2016 from the same base.

THE ASIAN AGE

Thu, 02 Mar, 2017

DRDO radar that can spot Pak's weapons is ready

The Defence Research and development Organisation will hand over indigenous weapon-location radar to the Army Thursday. Bharat Electronics Ltd. will then produce the DRDO-developed WLR under a technology transfer pact. In the 1999 Kargil War, the Indian Army lacked such weapon-locating radar, which the Pakistani Army had.

"The WLR detects and locates the weapon.. within seconds before the round land, enabling quick, accurate counter-artillery return fire," a person familiar with the matter told this newspaper.

THE HINDU

Thu, 02 Mar, 2017

DRDO inks deal to make key alloy

'Non-exclusive' licencing deal for armour applications

The Defence Research and Development Organisation (DRDO) on Wednesday signed a technology transfer agreement with Jindal Stainless (Hisar) Limited (JSHL) for manufacturing High Nitrogen Steel (HNS). The alloy has significant applications in the defence sector, but currently the country is largely dependent on imports.

The "non-exclusive" licencing agreement for armour applications was signed between the Defence Metallurgical Research Laboratory (DMRL), the Hyderabad-based laboratory of the DRDO and the JSHL.

Officials said HNS steel, which has a much higher ballistic strength than normal steel, will free the country of imports.

“HNS is not only tough but also has good strength. In addition to being non-magnetic and corrosion-resistant, the HNS cost is about 40% less compared to Rolled Homogenous Armour Steel (RHA),” DRDO said in a statement.

Better materials - Dr. Subhash Bhamre, Minister of State for Defence, noted that the HNS technology would further the Army’s quest for lighter and high-performance armouring material compared to materials currently in use. The JSHL said in a statement that HNS had passed multiple levels of ballistic tests in different calibres, with 8-10 times higher impact/blast protection. “We are looking at production of 15,000 to 20,000 tonnes of HNS per annum initially, which will be increased gradually. It will be priced 30-40% cheaper than the imported material,” Mr. Abhyuday Jindal, Vice-Chairman JSHL, said.

HNS, by virtue of its strength and characteristics, has potential application in all armoured vehicles, and the JSHL has several upcoming programmes, including the Infantry Combat Vehicle (ICV), Light Specialty Vehicle (LSV) and such others.

THE ASIAN AGE

Thu, 02 Mar, 2017

Heavy firepower to fight terrorists this summer

Army, paramilitary forces get advanced weapons.

New Delhi: The Centre has given a major push to equip the Army and central paramilitary forces with advanced weapons and equipment in anticipation of increased militant activity in Kashmir valley in summer.

Intelligence agencies have hinted that militant activity may reach an all-time high this summer, people familiar with the matter said. This was the first time in over a decade that any government has overhauled the entire weapon system of security forces deployed in the Valley, the people said.

They said the first consignment of lightweight bulletproof vests — which has been a longstanding demand of the security forces — and mine and bulletproof vehicles, lightweight rocket launchers (shoulder mounted), Tavor assault rifles and rapid-fire Glock 17 pistols have already reached the Valley. The next lot is expected in the next few weeks.

In the next batch, the security forces would be armed with H&K MP-5 sub-machine guns (known for low recoil), sniper rifles, improved communication gadgets and special boots which can sustain an improvised explosive device blast.

People familiar with the matter said this was a major initiative by the Centre in its fight against terror in the Valley, and the entire equipment will be delivered to security personnel before the onset of summer.

The Centre is still exploring possibilities of procuring non-lethal weapons for crowd control, although the paramilitary Central Reserve Police Force has already said it was planning to use a modified version of the pellet guns. These guns allegedly inflicted severe eye injuries to protesters in the Valley last year.

“While we want to insulate protesters from any major injuries, there will be major crackdown against militants in the summer months,” said a security officer who did not want to be named.

“Intelligence reports already suggest that militants are planning major offensive in the Valley. Even last year the infiltration attempts were at an all-time high,” the officer said. The new weapons will also be given to forces deployed along the International Border and the Line of Control with Pakistan.

Apart from better equipment, security forces, particularly paramilitary forces, have been told that their personnel should get the “best available quality” food.

The commanding officers have been asked to check and taste the food before it is served to soldiers. Recently, Border Security Force constable Tej Bahadur posted a video on social media that showed poor quality food given to soldiers.

Make in India: Jindal Stainless (Hisar) forays into defence

By Jyoti Mukul

Becomes the first company in India to commercially produce high nitrogen steel

Jindal Stainless (Hisar) Limited, country's largest integrated stainless steel producer, on Wednesday announced its entry into the defence sector by signing the license agreement with Defence Research & Development Organisation (DRDO) for manufacturing high nitrogen steel (HNS) for armour applications.

With this, Jindal Stainless becomes India's first company to commercially manufacture high nitrogen steel for the defence sector under the transfer of technology from DRDO. The use of HNS will replace the existing import of Rolled Homogenous Armour (RHA), thereby resulting in improved cost efficiency in material acquisition for armour applications by 50 per cent, the company said in a statement.

The company is a comprehensive joint effort, and almost a decade of research and development by JSHL and Defence Metallurgical Research Laboratory (DMRL) to develop HNS.

This major development will not only accelerate the indigenization process of Indian defence arsenal in line with government's 'Make in India' drive but will also help in easy availability of best material for manufacturing lighter armour vehicles, as import procurement often delays the manufacturing process.

High Nitrogen Steel is corrosion resistant and provides exceptional ballistic/blast protection than the existing material at a much reduced thickness along with longevity which increases the fuel and mass efficiency.

HNS exhibits higher energy absorption level, enhances crashworthiness to the entire artillery system and has significantly higher impact values (> 200 Joules at room temperature and > 150 Joules at -40C) as compared to RHA which make HNS a far superior material for blast protection. HNS has passed multiple levels of ballistic tests in different calibers with 8-10 times higher impact/blast protection.

HNS has potential application in all armoured vehicles including Infantry Combat Vehicle (ICV), Light Specialty Vehicle (LSV), Light Armoured Multipurpose Vehicle (LAMV), Futuristic Infantry Combat Vehicle (FICV), Main Battle Tank (MBT), Future Ready Combat Vehicle (FRCV), Aviation and Naval systems. JSHL is also working to produce additional variants of HNS with enhanced blast and ballistic protection to cater to niche requirements of the Indian Defence sector.

Abhyuday Jindal, Vice Chairman, Jindal Stainless (Hisar) Limited, said, "We believe HNS will immensely benefit the Indian defence sector, going forward. The hard-work and perseverance of 10 years of JSHL with Ministry of Defence has culminated in a fantastic result for the country in line with PM's vision of Make in India." HNS is manufactured at JSHL unit at Hisar with triplex refining route and manufacturing process has already been optimized for industry scale production to cater to stringent and niche requirements of Indian defence and paramilitary forces.

JSHL and DMRL together have developed the Quality Assurance Plan for the High Nitrogen Steel to ensure consistent quality to meet the future demand of HNS.

Jindal Stainless (Hisar) is India's first stainless steel manufacturing unit. JSHL has its operations integrated, both backward and forward, starting from melting, casting, hot rolling to cold rolling and other value additions.

JSHL has a melt capacity of 8,00,000 TPA, one of the largest in India. It is also the world's largest producer of stainless steel strips for razor blades and India's largest producer of coin blanks, serving the needs of Indian and international mints.

Sanctions by US Threaten to Chop Off Russian Arms

By Manu Pubby

Failure of Russian cos to offer bank guarantee may upset India's plans to buy key equipment



India's plans to procure strategic defence equipment from Russia including contracts of \$5.5 billion for shipbuilding appear to be in jeopardy because Russian firms are unable to furnish the requisite guarantees from Indian banks owing to sanctions imposed by the US.

This has raised concerns in India over procurement of the S-400 missile shield as well, which is sorely needed to seal the country's airspace with Pakistan, said people familiar with the matter.

Russia had in October last year signed an inter-governmental agreement with India for the sale of four Project 1135.6 class stealth frigates, two of which are to be made in India. The deal also involves creating shipbuilding infrastructure in India. Besides, Russia will be a key contender in an upcoming tender for a new class of conventional submarines under the P 75I project of the Indian Navy.

Both these projects seem to have hit a roadblock due to the US-imposed sanctions.

As per Indian rules, all foreign vendors of defence equipment need to furnish guarantees from designated Indian banks before bidding for any

project.

However, with the US-imposed Specially Designated Nationals (SDN) sanctions on Russia's United Shipbuilding Corporation, which were extended last year to include all entities attached to the company, Indian banks are not in a position to grant guarantees for the contracts.

“No Indian bank can deal with any entity on the SDN list as this will get them into major trouble with the US. As international transactions involve trade in dollars, no bank can afford to be noncompliant with the sanctions list,” an official told ET on condition of anonymity.

The matter can be resolved only if India amends its procurement rules to give Russian entities special exemption from the clause mandating bank guarantees, the people cited earlier said.

The last deal India signed with a Russian shipyard was to overhaul its Kilo class submarines at the Zvezdochka shipyard. Two Indian submarines are already undergoing the life extension programme. However, Zvezdochka too was named in the extended list of sanctions by the US late last year.

One of India's biggest deals with Russia till date, for the S-400 missile shield, too faces uncertainty due to the sanctions. Almaz-Antey, which manufactures the cutting-edge missile shield, is also on the SDN list, making it impossible for Indian banks and even private sector companies that have other overseas interests to deal with it. “India may need to change its rules to allow the Russian companies to furnish guarantees either directly from Russian banks or have some other arrangements if these projects have to go through,” the official said.

A senior team from Russia is expected to discuss the matter with the Indian side later this month.

Russia has traditionally been India's largest military supplier, accounting for most major purchases by the air force, army and navy. This position has, however, been strongly contested, with the US inking large deals in the past five years that have taken it to the top position. India's plans for military acquisitions in the future

envisage mostly joint development and production of equipment domestically with assistance from foreign vendors.



Thu, 02 Mar, 2017

Indo-Oman Army exercise in Chamba

The Indo-Oman joint Army exercise Al Nagah-II 2017 will be conducted from March 6 to 19 in the Dhauladhar ranges at Bakloh in Chamba district.

This is the second joint military exercise. The first one was held in Oman in January 2015.

Disclosing this today, Lt Col Manish Mehta, a Defence spokesperson, said the troops had been drawn from one Infantry battalion each from the Indian Army and the Royal Army of Oman. Approximately 60 troops from both countries would participate in the exercise, he added.

Lt Col Mehta said the aim of the exercise was to build and promote bilateral military relations and enhance inter-operability while exchanging skills and experiences between the Army and the Royal Army of Oman. He said an added aim of the exercise was to qualitatively enhance the knowledge of each other's military procedures, thus increasing the scope for inter-operability and better responsiveness to a common threat.

He said the Indian troops had undergone extensive training on rock craft, slithering, counter-terrorism or low-intensity conflict operations in addition to tactical drills of close cordon and house intervention drills to fulfil the mandate of the joint exercise.

He said the 14-day exercise with the Royal Army of Oman was scheduled to be conducted in multiple modules in order to achieve complete integration between the two contingents at every stage. The vast experience and expertise gained by the Indian troops in counter insurgency operations held special importance to the Oman Army. The joint exercise would, therefore, set the stage for greater defence cooperation between the two nations, he disclosed.



Thu, 02 Mar, 2017

Defence Ministry 'can't review' Army inquiry decisions

By Vijay Mohan

AFT relief for brig

- *A general power in relation to discipline is available to the Ministry of Defence, but this does not mean that it is empowered to review or revise findings of a court of inquiry duly constituted by the Army and the subsequent action undertaken by the competent authority thereof. The AFT has ordered the promotion of a Brigadier against whom the MoD had ordered fresh action for alleged irregularities in procurements*

There is no "specific" power vested in the Ministry of Defence (MoD) to review or revise findings of a court of inquiry duly constituted by the Army and subsequent action undertaken by the competent authority thereof, the Armed Forces Tribunal (AFT) has ruled.

Directing the MoD and the Army to promote a Brigadier to the rank of Major General, against whom the MoD had ordered fresh action for alleged irregularities in procurements after he was approved for promotion, the AFT held while a general power in relation to discipline is available to the ministry under rules, this does not mean that the MoD is empowered under this provision to deal with the case at hand in a way they have dealt with it.

Based upon complaints, a court of inquiry convened by the General Officer Commanding, 14 Corps had held three brigadiers blameworthy for irregularities and procedural lapses during procuring equipment for Border Roads Project Himank in Ladakh. The inquiry did not find any financial loss to the exchequer and the three officers were awarded a severe displeasure (non-recordable) by way of administrative action in December 2015.

In 2014, the officer had been approved for promotion as Major General in the “staff only” stream after necessary Vigilance clearance by the MoD. In September 2015, an officer whose name figured below that of the petitioner in the merit list was promoted and the aforementioned court of inquiry ordered the same month.

The MoD did not take any decision regarding the promotion of the petitioner and in May 2016 directed the Army HQs to review the quantum of punishment. When the Army HQs replied that such a move was inappropriate, the MoD, in December 2016, ordered the Army to hold a fresh court of inquiry. This was again negated by the Army on grounds of being legally incorrect.

In January 2017, the MoD, observing that the punishment was not commensurate with the seriousness of the charges, directed the Army HQs to initiate disciplinary action (court martial) against the petitioner, on which certain issues were raised by the Army HQs and the move remained in abeyance.

“The MoD does not have a case that the inquiry conducted was not proper or wrong. It is nobody’s case that the findings entered in the inquiry were baseless or wrong,” the AFT ruled. In such circumstances where is the authority for the MoD to interfere with the punishment imposed by the competent authority, the FAT questioned while observing that action was sought by the MoD only against the petitioner and not the other two similarly placed brigadiers.



Thu, 02 Mar, 2017

Senior Army Officers Get Clean Chit in Scam Probe

The suspicion to the contrary nursed by the investigators earlier notwithstanding, the Thane Police on Wednesday ruled out the involvement of any senior Army official in the much-discussed recruitment question papers leak scam, in which 21 people have so far been arrested.

Talking to mediapersons, Thane police commissioner Param Bir Singh said, “Prima facie we do not see any senior officer is involved in this crime. The investigations have so far revealed that only lower level staff is involved in the leak of the question papers of examination conducted by the Army Recruitment Board (ARB)”.

Having arrested 21 people in connection with the scam, the Thane crime branch sleuths are looking for some accused, including one low-level staffer from Army Recruiting Office (ARO) Dhaklu Patil, who played a key role in the scam.

All the 21 people, including a retired Army officer and a serving paramilitary person, are in police custody till March 4.

Following the question paper leak, the Army Recruitment Board (ARB) postponed the examinations, scheduled to begin at 11 am on Sunday, for an indefinite period in at least nine centres across the State.

Acting on a tip-off, a 80-member team of crime branch officials from Thane had on Saturday night and in the early hours of Sunday conducted simultaneous raids in Nashik, Pune, Nagpur in Maharashtra and in the neighbouring Goa and arrested 21 people involved in the Army recruitment question leak scam.

The epi-centre of the scam was Phaltan town in Satara district of western Maharashtra, where a team of investigators has rushed to carry out investigations. “Our team is camping there to get to the bottom of the scam,” Singh said.

Already in the custody is Santosh Shinde the owner of the Raje Chatrapati Academy, of Phalan of Satara district, who is one of the key players in the scam.

Dwelling upon the modus operandi, Singh said, “The question papers were usually dispatched by the ARB in a CD form to the AROs who in turn get them printed and make use of the same for the exams. The papers might have been leaked at the dispatch level where lower level staff of the Army is involved.”

That something might have been amiss even during the ARB examination held in 2016 could be gauged from that of nearly 50 students from the various private institutes from Maharashtra who had appeared for the examination last year, 48 cleared the examination.

“The ARB will look into whether the students concerned from Maharashtra used unfair means to clear the examination,” the Thane police chief said.

According to Singh, the Thane police have been in constant touch with the Director of Army examinations and exchanging information, ever since they got a tip-off about the possible leak of question papers.

The investigations have so far revealed that the students who managed to obtain the leaked question papers, had paid middlemen to the tune of Rs. 50 lakh to the middlemen and were to pay collectively a sum of Rs. 1.35 crore before or immediately after the examination which came to be cancelled.

The key players in the scam were the directors and owners of private coaching institutes, a majority of whom are currently in the custody, had contacted the students from other coaching institutes and offered them to provide leaked question papers for a price.

Meanwhile, the police identified three accused persons currently in the custody of the Nagpur Army officials as Ravinder Kumar, Dharamvir Singh, Nikam Kumar Pandey, who are among the 21 persons arrested in connection with the scam.

The others arrested so far include: Ranjit Jadhav (27) of Satara from the Para Military force, Ramappa Lundappa Patole (48) of Pune, a retired Army man., Mahendra Sonawane (31), currently working with the Army, Depot Unit, Kirkee, Pune, Subash Nirmale (50) of Akola, the owner of the Captain Subash Nirmale Career Academy, Jaikumar Shankar Velkode (31) of Wardha owner of the Tango Charli Academy of Nagpur, Sandeep Nagre(31) and Kiran Gamne (32), both from Nashik of the Nashikkar Career Academy of Nashik.

The arrested persons have been booked under section 409 (criminal breach of trust by a public servant, or by banker, merchant or agent), 420 (cheating), 120-B (conspiracy) of the IPC and also sections 72 of the IT Act and also section 13(1), 13(c) and 13(d) of the Prevention of Corruption Act.

MAIL TODAY

Thu, 02 Mar, 2017

CBI probe ordered in Army recruitment scam

Taking a strong view against allegation of corruption in hiring of jawans, Defence Minister Manohar Parrikar has decided to order a CBI probe into the alleged wrongdoings in Army recruitment in Pune where exam question papers were leaked.

“The defence minister has decided to hand over the probe to the CBI as there is a possibility of a big corruption racket in it,” defence ministry sources told MAIL TODAY. The matter of corruption in recruitment of jawans came up after the crime branch of Thane police in Maharashtra on Sunday detained over 350 students and rounded about 18 accused from Pune, Nagpur, Nashik and Goa late on Saturday on the suspicion of leaking question papers linked to the exams.

After the matter was exposed, the Army had cancelled the exams in six centres in western India for some lower-level posts. The examination centres where the tests were cancelled include Kamptee, Nagpur, Ahmednagar, Ahmedabad, Goa and Kirkee. The exams were held for a number of posts, including soldier clerk, strongman and soldier tradesman in 52 centres across the country.

The sources said Army has ordered an internal enquiry and further action will be taken based on the findings, adding tests at more centres are likely to be cancelled. Thane police had received a tip-off that around 350 candidates were made available with the leaked question papers by coaching institutes late on Sunday in exchange for `2 lakh.

पंजाब केसरी

Thu, 02 Mar, 2017

कोई अनुभवी नेता बन सकता है भारत में रूस का अगला राजदूत

नई दिल्ली, (वार्ता): रूस किसी अनुभवी राजनेता को भारत का अगला राजदूत बना सकता है। श्री अलेक्सांद्र, कदाकिन के निधन के बाद से यह पद खाली है। राजनयिक सूत्रों ने यूनीवार्ता से कहा, भारत - रूस के दोस्ताना सम्बन्धों के विशेष

दर्जे के कारण इस पद पर किसी राजनेता की नियुक्ति किये जाने की संभावना है। वैश्विक और क्षेत्रीय भू -राजनैतिक स्थिति में बदलाव के कारण रूस की विदेश नीति में बेशक रणनीतिक बदलाव आया है लेकिन भारत अब भी उसका सबसे विश्वसनीय सहयोगी है।



Wed, 01 Mar, 2017

(Online)

South Korea, U.S. begin large-scale annual drills amid North Korea tension

South Korean and U.S. troops began large-scale joint military exercise on Wednesday conducted annually to test their defence readiness against the threat from North Korea, which routinely characterises the drills as preparation for war against it. The exercise, called Foal Eagle, comes amid heightened tension following the latest test launch of a ballistic missile by the North on Feb. 12 and in the past prompted threats by Pyongyang to launch military action in retaliation.

South Korea's Defense Ministry and the U.S. military based in the South confirmed the start of the drills on Wednesday that will continue until the end of April but did not immediately provide further details.

The exercise last year involved about 17,000 American troops and more than 300,000 South Koreans.

U.S. Defense Secretary Jim Mattis spoke with South Korean Defense Minister Han Min-Koo early on Wednesday by telephone and said the United States remains steadfast in its commitment to the defense of its ally.

Mattis welcomed a deal signed by South Korea with the Lotte Group conglomerate this week to secure the land to station the Terminal High Altitude Area Defense (THAAD) missile defense system in the South, the two countries said.

South Korea has said it and the United States aim to make the system, which the two countries decided last year to deploy in response to the North Korean missile threat, operational by the end of the year.

Han said in the phone call with Mattis that this year's joint drills will be conducted at a similar scale as last year's, which the South's Defense Ministry had called the "largest-ever" exercises by the allies.

North Korea's official KCNA news agency said earlier on Wednesday its leader Kim Jong Un inspected the headquarters of a major military unit and issued guidance on increasing combat readiness.

(Reporting by Jack Kim and Ju-min Park in Seoul and Phil Stewart in Washington; Editing by Michael Perry)



Thu, 02 Mar, 2017

Remembering a pioneer of scientific research

By Saroj Upadhyay, Sudeshna Gupta

Mahendralal Sarkar the renowned physician who had the privilege of treating Sri Ramakrishna was not only a brilliant homeopath but was also a social reformer and an ardent propagator of science education and research. His colourful life is an illustration of the many dimensions of his personality and achievements. He became a spiritualist after coming into contact with Sri Ramakrishna. But he was also a propagator of the scientific view of life. He was the founder of the Indian Association for the Cultivation of Science where Nobel Laureate CV Raman and many other scientists started their scientific experiments.

Mahendralal secured admission in Hare School as a free student in 1840. He passed the junior scholarship examination and joined Hindu College(Presidency College) in 1849 where he studied up to 1854. He was transferred to Calcutta Medical College since Hindu College didn't have a science department. He passed the final examination in 1860 in medicine, surgery and midwifery. In 1863, he got the degree of MD. He and Jagabandhu Bose were the second MDs of the Calcutta University after Chandrakumar De (1862).

Mahendralal within a short period turned into a reputed doctor. He was so well regarded that other physicians used to send their patients to him for consultation. He was selected as the secretary of the Bengal branch of the British Medical Association in 1863. During this time, he criticised homeopathy as the practice of quacks. But soon some events brought a drastic change in his outlook towards homeopathic treatment which Mahendralal had described in the July issue of his journal, Calcutta Journal of Medicine.

He was given a copy of Morgan's Philosophy Of Homeopathy for review in the journal, the Indian Field. Mahendralal took it as an opportunity to criticise homeopathy but later changed his mind as he realised that without knowing anything about homeopathy it would be unfair to write such a review. Mahendralal went to Rajendralal Datta, an eminent physician who was also a homeopathic practitioner.

Mahendralal started verifying the results of Rajendralal's homeopathic treatment. Besides, he himself prepared some homeopathic medicines and observed their effect on patients. He was soon convinced that homeopathic treatment was scientific and himself started homeopathic treatments (which were less costly than allopathy).

On 16 February 1867, during the fourth annual meeting of the Medical Association, of which Mahendralal was the Vice-President, he gave a lecture on "The uncertainties in medical sciences and the relationship between diseases and their remedial agents." In this lecture he spoke in favour of homeopathic treatment which created an uproar among the audience. As a result he was ousted from the British Medical Association.

In January 1868 Mahendralal founded a journal called Calcutta Journal of Medicine, with himself as editor. The main aim of this journal was to popularise homeopathic treatment. In the beginning, Mahendralal had no patients but reading of Materia Medica of Homeopathy changed things. He was also inspired by the philosophy of Samuel Hahnemann who abandoned the existing practices of medicine which caused bloodletting and discovered the homeopathic system on purely humanitarian grounds. Eventually Sarkar became one of the top homeopaths. The celebrated homeopath of Calcutta, Dr. Berigny, while leaving the city, compared himself with the upcoming Mahendralal and said, "Now the moon is to set because we are seeing the rising sun on the horizon."

Dr. Sarkar was a humanist who believed that science could add to the prosperity of humanity and the cultivation of modern science was required to remove poverty and ignorance of Indians. During those days

only government organizations like the Geological survey of India facilitated scientific research work and universities were only degree-awarding authorities. Mahendralal wrote an article in the Calcutta Journal of Medicine on the need to establish a national institution for the cultivation of sciences by his countrymen. He wrote that this institution would be run on the lines of London's Royal Institution and the British Association for the Advancement of science.

Regarding the institution's main intention Mahendralal said: "We want a different institution altogether. We want an institution which shall be for the instruction of the masses, where lectures on scientific subjects will be systematically delivered and not only illustrative experiments performed by the lecturer, but the audience should be invited and taught to perform themselves. And we wish that this institution be entirely under native management and control."

The Hindu Patriot in its issue dated 3 January 1870 published an advertisement regarding the establishment of the institution.

Supporting Mahendralal's work, Bankim Chandra wrote a lengthy article in the Bhadra issue (August-September issue) of his journal Bangadarshan (1873) where he appealed for generous public financial support for his work. He wrote:

"...The rich people of Bengal... some of them spend a lakh of rupees in a single day and waste lakhs during the marriage of their sons and daughters. The Bengali society is apathetic towards the cultivation of science. The rich people of Bengal should be generous and assist the Youth and industries of Bengal."

Good response came from many eminent citizens of Calcutta. These included Justice Dwarakanath Mitra, Krishnadas Pal, Father Lafont, Ishwar Chandra Vidyasagar, Dr.Rajendralal Mitra, Keshab Chandra Sen, Jatindramohan Tagore, Abdul Latif, Jaykrishna Mukherjee, Pyarimohan Mukherjee, Ramesh Chandra Banerjee, and Gurudas Banerjee. Sir Richard Temple, the Lieutenant Governor of Bengal, also assured his help. Donations started flowing in.

The first contribution of Rs. 1,000 came from Jaykrishna Mukherjee and a subscription book was started on 24 January 1870. Others who contributed money were the Maharaja of Patiala , Maharani Swarnamayi, Maharaja of Cassimbazar , Kalikrishna Tagore, Raja Kamal Krishna Deb and Sri Rameshchandra Mitra. It was Ishwar Chandra Vidyasagar who collected Rs. 2500 from zamindar Kalikrishna Tagore. With the help of Keshab Chandra Sen, Mahendralal received much financial help from the Maharaja of Cooch Behar. And in 1873, Mahendralal himself donated Rs. 1,000 for the noble cause.

On 29 July 1876 the Indian Association for the Cultivation of Science was inaugurated in a house taken on lease from the Government. It was situated at the junction of College Street and Bowbazar Street. The name "The Indian Association for the Cultivation of Science" was accepted at a meeting held earlier, on 15 January 1876. Dr. Mahendralal Sarkar was its Secretary from the beginning till his death. He gave regular lectures on subjects like electricity, magnetism, heat, light and sound.

Between 1878 and 1883 he delivered about 154 lectures on different subjects. Mahendralal continued to enlist support for the Association, especially from rich patients whom he cured. One such was the Maharajkumar of Vizianagram, and with his donation of Rs. 40,000, the Vizianagram Laboratory was established.

From the very beginning many renowned scientists were either speakers or research scholars in the Association. For instance Acharya Jagadish Chandra Bose, Acharya Prafulla Chandra Ray, Dr. Chunilal Basu, Sri Ashutosh Mukhopadhyaya and others gave lectures on their respective subjects. Acharya Jagadish Chandra Bose used to conduct practical classes also.

The Science Association developed further after the death of Mahendralal. In 1907 a high-ranking officer in the finance department of the government of India, Chandrashekhara Venkataraman, working at Calcutta , became a member of the Association and pursued scientific research during his leisure time. In 1917 the vice-chancellor of Calcutta University, Sir Ashutosh Mukhopadhyaya, made him "Fellow Professor" in the Science College.

Since the required equipment for research was not available in the Science College, Venkataraman continued his research in the Science Association. In 1930 he discovered new facts about the diffusion of light rays, for which he was awarded the Nobel Prize. In 1950-51 Professor Meghnad Saha shifted the The Science Association to a new building constructed on a land measuring 29 bighas.

Thus we see that Mahendralal Sarkar, a great philanthropist devoted his life to establish and promote scientific research and in spreading the homeopathic system of medicine. In all his efforts, service to humanity was the driving force. *The writers are, respectively, Senior Faculty and Faculty of Neotia Institute of Technology, Management and Sciences.*